

CLAIMS

What is claimed is:

- 1 1. A computer implemented method comprising:
 - 2 first translating a first plurality of representations of a plurality of parts of a
 - 3 plurality of sub-assemblies of an mechanical design assembly to a second plurality
 - 4 of representations of the parts of the sub-assemblies of the mechanical design
 - 5 assembly; and
 - 6 thereafter, translating one or more assembly constraints of said assembly by
 - 7 correspondingly constraining geometric entities within said translated
 - 8 representations that are counterpart to geometric entities of said pre-translation
 - 9 representation constrained by said one or more assembly constraints.
- 1 2. The method of claim 1, wherein said translating of first representations of said
- 2 parts of said sub-assemblies comprises tracking correspondence between said first
- 3 and said second plurality of representations of said parts and sub-assemblies of the
- 4 mechanical design assembly during said translation.
- 1 3. The method of claim 1, wherein said translating of one or more assembly
- 2 constraints comprises identifying said counterpart geometric entities within said
- 3 translated representation.
- 1 4. The method of claim 3, wherein said identifying comprises
- 2 identifying said geometric entities within said pre-translated representations
- 3 constrained by said one or more assembly constraints;

4 selecting a plurality of spatial sampling points for each of said identified
5 geometry within said pre-translation representations, constrained by said one or
6 more assembly constraints, and
7 for each of said identified geometry within said pre-translation
8 representations, applying its selected spatial sampling points to geometric entities
9 within said translated representations to identify its counterpart geometry/geometric
10 entities.

1 5. The method of claim 1, wherein said one or more assembly constraints
2 comprise a selected one of a mating constraint and a flush constraint constraining
3 on at least a first and a second sub-assembly/part of said first plurality of sub-
4 assemblies/parts.

1 6. The method of claim 1, wherein said one or more assembly constraints
2 comprise a selected one of an angle constraint and a rotational constraint
3 constraining on at least a first and a second sub-assembly/part of said first plurality
4 of sub-assemblies/parts.

1 7. An article of manufacture comprising:
2 a recordable medium having recorded thereon a plurality of machine
3 executable programming instructions designed to program a host machine to enable
4 the host machine to
5 first translate a first plurality of representations of a plurality of parts of a
6 plurality of sub-assemblies of a mechanical design assembly to a second
7 plurality of representations of the parts of the sub-assemblies of the
8 mechanical design assembly; and

9 thereafter, translate one or more assembly constraints of said assembly
10 by correspondingly constraining geometric entities within the translated
11 representations that are counterpart to geometric entities within the pre-
12 translation representation constrained by said one or more assembly
13 constraints.

1 8. The article of manufacture of claim 7, wherein said programming instructions
2 further enable the host machine to track correspondence between said first and said
3 second plurality of representations of said parts and sub-assemblies of the
4 mechanical design assembly during said translation.

1 9. The article of claim 7, wherein said programming instructions enable the host
2 machine to identify said counterpart geometric entities within said translated
3 representation.

1 10. The article of claim 9, wherein said programming instructions enable the host
2 machine to

3 identify said geometric entities within said pre-translated representations
4 constrained by said one or more assembly constraints;

5 select a plurality of spatial sampling points for each of said identified
6 geometry within said pre-translation representations, constrained by said one or
7 more assembly constraints, and

8 for each of said identified geometry within said pre-translation
9 representations, apply its selected spatial sampling points to geometric entities
10 within said translated representations to identify its counterpart geometry/geometric
11 entities.

1 11. A computer system comprising:
2 a storage medium having stored therein a plurality of programming
3 instructions to first translate a first plurality of representations of a plurality of parts of
4 a plurality of sub-assemblies of a mechanical design assembly to a second plurality
5 of representations of the parts of the sub-assemblies of the mechanical design
6 assembly, and thereafter, translate one or more assembly constraints of said
7 assembly by correspondingly constraining geometric entities within the translated
8 representations that are counterpart to geometric entities of the pre-translation
9 representations constrained by said one or more assembly constraints; and
10 a processor coupled to the storage medium to execute the programming
11 instructions.

1 12. The computer system of claim 11, wherein said programming instructions are
2 further designed to track correspondence between said first and said second
3 plurality of representations of said parts and sub-assemblies of the mechanical
4 design assembly during said translation.

1 13. The computer system of claim 11, wherein said programming instructions are
2 designed to identify said counterpart geometric entities within said translated
3 representation.

1 14. The computer system of claim 13, wherein said programming instructions are
2 designed to
3 identify said geometric entities within said pre-translated representations
4 constrained by said one or more assembly constraints;

5 select a plurality of spatial sampling points for each of said identified
6 geometry within said pre-translation representations, constrained by said one or
7 more assembly constraints, and
8 for each of said identified geometry within said pre-translation
9 representations, apply its selected spatial sampling points to geometric entities
10 within said translated representations to identify its counterpart geometry/geometric
11 entities.

1 15. A method comprising:
2 determining geometric entities within a plurality of translated representations
3 of sub-assemblies/parts of a mechanical design assembly that are corresponding to
4 geometric entities within a plurality of pre-translation representations of the sub-
5 assemblies/parts of the mechanical design assembly, constrained by one or more
6 assembly constraints of the mechanical design assembly; and
7 correspondingly constraining the determined counterpart geometric entities
8 within the translated representations of the sub-assemblies/parts to effectively
9 translate said one or more assembly constraints of the mechanical design assembly.

1 16. The method of claim 15, wherein said determining comprises
2 identifying said geometric entities within said pre-translated representations
3 constrained by said one or more assembly constraints;
4 selecting a plurality of spatial sampling points for each of said identified
5 geometry within said pre-translation representations, constrained by said one or
6 more assembly constraints, and
7 for each of said identified geometry within said pre-translation
8 representations, applying its selected spatial sampling points to geometric entities

9 within said translated representations to identify its counterpart geometry/geometric
10 entities.

1 17. An article of manufacture comprising:

2 a recordable medium having recorded thereon a plurality of machine
3 executable programming instructions designed to program a host machine to
4 enable the host machine to
5 determine geometric entities within a plurality of translated
6 representations of sub-assemblies/parts of a mechanical design assembly
7 that are corresponding to geometric entities within a plurality of pre-
8 translation representations of the sub-assemblies/parts of the mechanical
9 design assembly, constrained by one or more assembly constraints of the
10 mechanical design assembly; and

11 correspondingly constraining the determined counterpart geometric
12 entities of the plurality of translated representations of the sub-
13 assemblies/parts to effectively translate said one or more assembly
14 constraints of the mechanical design assembly.

1 18. The article of claim 17, wherein said programming instructions enable the
2 host machine to

3 identify said geometric entities within said pre-translated representations
4 constrained by said one or more assembly constraints;

5 select a plurality of spatial sampling points for each of said identified
6 geometry within said pre-translation representations, constrained by said one or
7 more assembly constraints, and

8 for each of said identified geometry within said pre-translation
9 representations, apply its selected spatial sampling points to geometric entities

10 within said translated representations to identify its counterpart geometry/geometric
11 entities.

1 19. A computer system comprising:

2 a storage medium having therein a plurality of programming instructions to
3 determine geometric entities within a plurality of translated representations of sub-
4 assemblies/parts of a mechanical design assembly that are corresponding to
5 geometric entities within a plurality of pre-translation representations of the sub-
6 assemblies/parts of the mechanical design assembly, constrained by one or more
7 assembly constraints of the mechanical design assembly, and correspondingly
8 constraining the determined counterpart geometric entities of the plurality of
9 translated representations of the sub-assemblies/parts to effectively translate said
10 one or more assembly constraints of the mechanical design assembly; and
11 a processor coupled to the storage medium to execute the program
12 instructions.

1 20. The computer system of claim 19, wherein said programming instructions are
2 designed to

3 identify said geometric entities within said pre-translated representations
4 constrained by said one or more assembly constraints;

5 select a plurality of spatial sampling points for each of said identified
6 geometry within said pre-translation representations, constrained by said one or
7 more assembly constraints, and

8 for each of said identified geometry within said pre-translation
9 representations, apply its selected spatial sampling points to geometric entities
10 within said translated representations to identify its counterpart geometry/geometric
11 entities.